

## REMARKS

Claims 1-5, 7, 9-13, 15, 17, 18 and 20 remain pending in the application. Claims 6, 8, 14, 16 and 19 were previously cancelled. No claims are currently amended. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the amendments and remarks contained herein.

### 1. REJECTION UNDER 35 U.S.C. § 103 – GENC, EDLUND & PETTIT

Claims 1-5, 7, 9, 11-13, 15, 18 and 20 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Genc (U.S. Pub. No. 2002/0160245) in view of Edlund (U.S. Pub. No. 2002/0114984 and Pettit (U.S. Pub. No. 2005/0058861). This rejection is respectfully traversed.

The present claims are not obvious over Genc, Edlund, and Pettit as combination of these documents fails to provide all of the claimed features as arranged in the claim and there is no apparent reason for a skilled artisan to modify the combination to include the missing subject matter. See *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418, 82 USPQ2d 1385, 1396 (2007) (obviousness includes determining whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue); and *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991) (combined references must teach or suggest all the claim limitations to establish a *prima facie* case of obviousness).

In particular, the combination does not provide a first passive hydrogen vent configured to vent hydrogen from the first enclosure without reliance upon any electrical device or other active components to function. The combination further fails to provide a second enclosure with a second hydrogen vent. Moreover, there is no basis in the cited documents to adapt and modify

the release valve of Genc with aspects of the active hydrogen detection and dilution system of Pettit without including the active compressor ventilation stream and combustor.

Genc is concerned with operation of the cooling system and gas trapped therein during startup/operation, while Pettit is concerned with hydrogen generated during operation of the fuel cell. Genc discloses a release valve 30 having a membrane 40 operable to permit passage of gas and inhibit passage of liquid at a first pressure. Genc paragraphs [0019]-[0020] on pages 1-2; and Figure 2. Gases, mainly air, can be drawn into the cooling system from the outside due negative pressure or during a coolant drain. Genc paragraph [0004]. Gas contained in the cooling system during startup and operation needs to be removed. Genc paragraph [0004]. Genc is silent with respect to hydrogen or a need to vent hydrogen. And concerns with gas buildup are in relation only to operation of the cooling system.

The Pettit document discloses collecting and combusting hydrogen using electrical components and/or active components, such as a sensor (e.g., hydrogen detector), controller, or fan to provide a ventilation stream. Pettit paragraphs [0005], [0006], and [0047]. A compressor 54 pressurizes cathode effluent stream 34 which flows through WVT 56 and forms a ventilation stream 41. Pettit paragraph [0029]. The ventilation stream 41 captures and dilutes hydrogen within enclosure 40 where it is directed through a catalytic combustion element 72 to a combustor 46, forming an exhaust stream 70. Pettit paragraph [0030]. Thus, the compressor 54 and pressure of the ventilation stream 41 are active ventilation features, which are inapposite to the presently claimed first passive hydrogen vent, which is configured to vent hydrogen from the first enclosure without reliance upon any electrical device or other active components to function. See also Pettit paragraph [0047].

Moreover, Pettit does not actually vent hydrogen as hydrogen but instead combusts the hydrogen. The exhaust stream 70 comes from combustor system 46, which removes the hydrogen provided by anode effluent stream 32. Pettit paragraph [0031]; and see FIG. 1. The “combustor system 46 [is] operable to consume the remaining hydrogen in anode effluent stream 32.” Pettit paragraph [0021]. Thus, no hydrogen is vented via the exhaust stream 70 and accordingly it is not a hydrogen vent. No reason is provided as to why a skilled artisan would ignore and forgo this aspect of Pettit in favor of any other aspect.

The Edlund document provides a housing 140 that encompasses a fuel cell system. Edlund paragraph [0062] pages 7-8; Figure 11. The housing 140 can be combined with an energy-consuming device 25 that can include a body 142, such as a motor vehicle. Edlund paragraph [0064]. Edlund does not teach a vent in the housing 140 or in the body 142 and is silent regarding the buildup of hydrogen. The mere disclosure of housing 140 and device 142 implies nothing regarding vent placement.

Viewing the straightforward combination of the Genc, Pettit, and Edlund document (that is, without a hindsight analysis), a skilled artisan at best may combine the cooling system release valve (as per Genc) with active hydrogen detection and dilution features (as per Pettit) to form a fuel cell that reduces air in the cooling system and reduces hydrogen buildup in the fuel cell. The fuel cell could then be used to power a device such as a motor vehicle having a body (as per Edlund).

The Genc release valve and the Pettit hydrogen detection and dilution system address separate functions within a fuel cell, and therefore is no apparent reason for a skilled artisan to modify the Genc release valve to conform to the operation of the hydrogen dilution system of Pettit. In fact, Genc could not be modified to conform to Pettit, as the ventilation stream 41 in

Pettit collects hydrogen not only from coolant reservoir 58, but also from the interior of enclosure 40 and around the various components within the enclosure. Pettit paragraph [0030]. The Genc and Pettit disclosures might work in concert, but there is nothing to suggest Genc can be modified to perform the function of the hydrogen detection and dilution system of Pettit. The combustion aspects of Pettit would also be lost as would collection of hydrogen from within the whole fuel cell enclosure. The only nexus tying modification of the Genc release valve to operate akin to a hydrogen detection and dilution system as per Pettit is Applicants' own disclosure, which cannot serve as a predicate for obviousness. See *ATD Corporation v. Lydall, Inc.*, 159 F.3d 534, 48 USPQ2d 1321, 1329 (Fed. Cir. 1998) (obviousness cannot be based on the hindsight combination of components selectively culled from the prior art to fit the parameters of the patented invention).

What is more, there is nothing in Edlund to suggest putting any type of vent in both the housing 140 and the body 142. In fact, the hydrogen detection and dilution system of Pettit burns collected hydrogen, obviating any need to provide further passage of hydrogen gas and include an additional hydrogen vent. Hence, properly viewing each of the Genc, Pettit, and Edlund disclosures as a whole, there is no apparent reason for a skilled artisan to make the combination and modifications as alleged in the present rejection.

The combination of Genc, Edlund, and Pettit therefore cannot establish a case of obviousness. Reconsideration of the claims and withdrawal of the rejection are requested.

## **2. REJECTION UNDER 35 U.S.C. § 103 – GENC, EDLUND, PETTIT & BUZZELLI**

Claims 10 and 17 stands rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Genc (U.S. Pub. No. 2002/0160245) in view of Edlund (U.S. Pub. No. 2002/0114984, Pettit

(U.S. Pub. No. 2005/0058861) as applied to Claims 1 and 11 and further in view of Buzzelli (U.S. Pat. No. 4,168,349). This rejection is respectfully traversed.

The shortcomings of the Genc, Edlund, and Pettit combination are illustrated in the preceding section. Briefly, the release valve of Genc and the hydrogen detection and dilution system of Pettit are addressing different problems and function in different ways. Addition of Edlund fails to tie Genc and Pettit together and further fails to provide any basis to include hydrogen vents in its enclosure and body. The only way to bring the necessary features from these documents together and make the modifications necessary to replicate Applicants' claims is by using Applicants' disclosure.

Buzzelli is added to the document combination for disclosing an iron/air battery cell having a sintered ceramic vent that acts as a flame and explosion barrier. Buzzelli col. 2, lines 55-60. However, the Buzzelli document fails to overcome the deficiencies of Genc, Edlund, and Pettit. Namely, the combination of these four documents does not provide for a passive hydrogen vent configured to vent hydrogen from the first enclosure without reliance upon any electrical device or other active components to function. And there is no reason to modify the Genc release valve to conform with aspects of the hydrogen detection and dilution system of Pettit as these features are performing different functions. The combination also does not disclose actually venting hydrogen (hydrogen is instead combusted by the prior art); providing a passive vent in the Pettit apparatus would serve to contravene operation of the Pettit apparatus, an action the collective documents provide no reason to take. Claims 10 and 17 are therefore patentable.

Reconsideration of the claims and withdrawal of the rejection are requested.

### **3. REJECTION UNDER 35 U.S.C. § 103 – HOBMEYR & PETTIT**

Claims 1-5, 7, 11-13, 15 and 18 stands rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Hobmeyr (U.S. Pub. No. 2005/0106438) in view of Pettit (U.S. Pub. No. 2005/0058861). This rejection is respectfully traversed.

The present claims are not obvious over Hobmeyr in view of Pettit as these documents do not provide all of the claimed features as arranged in the claim and there is no apparent reason for a skilled artisan to modify the combination to include the missing subject matter. In particular, the combination does not provide a first passive hydrogen vent configured to vent hydrogen from a first enclosure and a second enclosure with a second hydrogen vent. Moreover, there is no basis in the cited documents to adapt and modify the hydrogen-permeable conduit of Hobmeyr with aspects of the active hydrogen detection and dilution system of Pettit without including Pettit's active compressor ventilation stream and combustor.

Hobmeyr discloses a fuel cell system with a cooling fluid flowing through a hydrogen-permeable conduit (HPC). Hobmeyr abstract. Hydrogen within the cooling fluid permeates through the HPC to reduce the hydrogen content of the cooling fluid. Hobmeyr paragraph [0005]. The HPC increases the hydrogen-content of the atmosphere immediately surrounding it as a result of hydrogen permeation therefrom, so the HPC is preferably located in an area having air flow therearound. Hobmeyr paragraph [0021].

Aspects of the Pettit document are described above, including a compressor that pressurizes a ventilation stream 41 which captures and dilutes hydrogen within enclosure 40 where the hydrogen is directed through a catalytic combustion element 72 to a combustor 46, forming an exhaust stream 70. Pettit paragraph [0030].

Straightforward combination of Hobmeyr and Pettit would include a fuel cell employing the HPC of Hobmeyr with the hydrogen detection and dilution system of Pettit. The HPC would release hydrogen where the ventilation stream powered by the compressor would collect and direct the hydrogen for combustion, as provided by Pettit. There is no apparent reason to modify the HPC of Hobmeyr to conform to the hydrogen concentration in Pettit and ignore the use of the ventilation stream to collect and combust hydrogen released from the HPC. These documents must be considered for all that they disclose and there must be an identified reason to contravene explicit beneficial aspects of their disclosures. There is no explanation as to why a skilled artisan would seek to make the HPC of Hobmeyr conform to the operational aspects of Pettit and forgo the hydrogen detection and dilution properties of the Pettit system. The only way to select, combine, and modify the necessary Hobmeyr and Pettit features to recreate the present claims is by basing such actions on Applicants' disclosure, which is not permissible.

In addition, there is no mention anywhere in Hobmeyr or Pettit of two enclosures each having a hydrogen vent. As presented above, the alleged "hydrogen vent" of Pettit is not a vent, the hydrogen is instead combusted so that no hydrogen is actually vented. And there is nothing in Hobmeyr that suggests any fitness or applicability in placing a second HPC in a second enclosure to operate as a hydrogen vent. The HPC is expressly for removing hydrogen from coolant and has coolant circulating therethrough; there is no indication of its fitness for other uses.

As such, the present claims are not obvious. Reconsideration of the claims and withdrawal of the rejection are requested.

#### **4. REJECTION UNDER 35 U.S.C. § 103 – HOBMEYR, PETTIT & EDLUND**

Claims 9 and 20 stands rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Hobmeyr (U.S. Pub. No. 2005/0106438) in view of Pettit (U.S. Pub. No. 2005/0058861) as applied to Claims 1 and 11 and further in view of Edlund (U.S. Pub. No. 2002/0114984). This rejection is respectfully traversed.

Claims 9 and 10 are not obvious in view of Hobmeyr, Pettit, and Edlund as these documents do not provide a first passive hydrogen vent configured to vent hydrogen from a first enclosure and a second enclosure with a second hydrogen vent. Moreover, there is no basis in the cited documents to adapt and modify the HPC of Hobmeyr with aspects of the active hydrogen detection and dilution system of Pettit without also including the active compressor pressurized ventilation stream and combustor.

The Hobmeyr and Pettit documents are described in the preceding section.

Addition of Edlund to the Hobmeyr and Pettit combination fails to cure the previously noted defects. Edlund provides a housing 140 that encompasses a fuel cell system. Edlund paragraph [0062] pages 7-8; Figure 11. The housing 140 can be combined with an energy-consuming device 25 that can include a body 142, such as a motor vehicle. Edlund paragraph [0064]. Edlund does not teach a vent in the housing 140 or in the body 142 and is silent regarding the buildup of hydrogen. There is nothing in Edlund to suggest putting any type of vent in both the housing 140 and the body 142. In fact, the hydrogen detection and dilution system of Pettit burns collected hydrogen, obviating any need to provide further passage of hydrogen gas and including an additional hydrogen vent.

Hence, properly viewing each of the Hobmeyr, Pettit, and Edlund disclosures as a whole, there is no apparent reason for a skilled artisan to make the alleged combination and



modifications. Reconsideration of the claims and withdrawal of the rejection are requested.

#### **5. REJECTION UNDER 35 U.S.C. § 103 – HOBMEYR, PETTIT & BUZZELLI**

Claims 10 and 17 stands rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Hobmeyr (U.S. Pub. No. 2005/0106438) in view of Pettit (U.S. Pub. No. 2005/0058861) as applied to Claims 1 and 11 and further in view of Buzzelli (U.S. Pat. No. 4,168,349). This rejection is respectfully traversed.

Claims 10 and 17 are not obvious over Hobmeyr, Pettit, and Buzzelli as the document combination does not provide a first passive hydrogen vent configured to vent hydrogen from a first enclosure and a second enclosure with a second hydrogen vent. Moreover, there is no basis in the cited documents to adapt and modify the hydrogen-permeable conduit of Hobmeyr with aspects of the active hydrogen detection and dilution system of Pettit without including the active compressor ventilation stream and combustor.

Buzzelli discloses an iron/air battery cell having a sintered ceramic vent that acts as a flame and explosion barrier. However, the Buzzelli document fails to overcome the deficiencies of Hobmeyr and Pettit. Namely, the combination of documents does not provide for a passive hydrogen vent configured to vent hydrogen from the first enclosure without reliance upon any electrical device or other active components to function. And there is no reason to use the Hobmeyr HPC without aspects of the hydrogen detection and dilution system of Pettit which provide active hydrogen combustion.

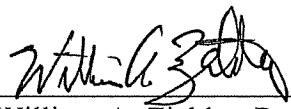
Reconsideration of the claims and withdrawal of the rejection are requested.

## 6. CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action and the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

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